

Table 1
CD28 family superagonistic epitopes
Epitopes are named according to the strands from which they derive.

<i>Protein</i>	<i>A'</i>	<i>B</i>	<i>C'-C'</i>	<i>C"-D</i>	<i>E</i>	<i>F</i>	<i>G</i>
hCD28	SPMLV	AVNLS	SLHKGLDSAVERVCV	VYSKTCGFNCDDG	FYLQN	TDIYFC	NGTIIHV
hCTLA-4	PAVVL	GIASFV	TVIQRQADSQVTEVCA	FLDDSDCTG	LTIQG	TGLYIC	NGTQIYV
hCOS	YEMFI	GVQIL	QLLKGGQILLCD	VSIKSLKFCHS	FFLYN	ANYYYFC	TGGYLHI
	(SEQ ID NOs:23, 24, 25)	(SEQ ID NOs:26, 27, 28)	(SEQ ID NOS:29, 30, 31)	(SEQ ID NOS:32, 33, 34)	(SEQ ID NOs:35, 36, 37)	(SEQ ID NOs:38, 39, 40)	(SEQ ID NOs:41, 42, 43)

PD-1 and BTLA superagonistic epitopes

<i>Protein</i>	<i>A</i>	<i>B</i>	<i>C'-C'</i>	<i>C"-D</i>	<i>E</i>	<i>F</i>	<i>G</i>
hPD-1	PALLVV	DNATF	RMSPSNQTDK	QPQQDQCRFR	MSVVR	NDSGTY	LRAELR
aBTLA	QSEHSI	DPFEL	KLN	QTSSWK	LHFEP	NDNGSY	TTLYVT
	(SEQ ID NOs:44, 45)	(SEQ ID NOs:46, 47)	(SEQ ID NOS:48, 49)	(SEQ ID NOS:50, 51)	(SEQ ID NOs:52, 53)	(SEQ ID NOs:54, 55)	(SEQ ID NOs:56, 57)

Table 3

<i>Protein</i>	<i>Sequence</i>
hCD28	GNYSQQQLQVYSKTI GF (SEQ ID NO:58)
hCTLA-4	YMMGNELTFLDDS (SEQ ID NO:59)
hCOS	KTKGS GNTVSIKSL K (SEQ ID NO:60)
hPD-1	LAAFPEDRSQPGQDCR (SEQ ID NO:61)

Table 5

DNA sequence of human CD28 cDNA (SEQ ID NO: 15)

agactctca	gccttggcag	gtgcgtctt	cagttccc	cacacttcg	gttcctcg	60
gaggagggc	tggAACCTA	gcccatcg	aggacaaaga	tgctcagg	gctcttgg	120
ctcaacttat	tcccttcaat	tcaagtaaca	ggaaacaaga	tttttgtgaa	gcagtgc	180
atgctttag	cgtacgacaa	tgcggtcaac	cttagctgca	agtattccta	caatctcttc	240
tcaaggagt	tccgggcate	ccttcacaaa	ggactggata	gtgctgtgga	agtctgtgtt	300
gtatatgg	attactccca	gcagttcag	gtttactcaa	aaacgggg	caactgtgat	360
ggaaaattgg	gcaatgaatc	agtgacattc	tacctccaga	atttgtatgt	taaccaaaca	420
gatatttact	tctgcaaaat	tgaagttatg	tatcctcctc	cttacotaga	caatgagaag	480
agcaatggaa	ccattatcca	tgtgaaaggg	aaacacctt	gtccaagtcc	cctatttccc	540
ggaccttcta	agccctttt	ggtgctgg	gtggttgg	gagtctggc	ttgctatagc	600
ttgctagtaa	cagtggc	tattatttc	tgggtgagga	gtaagaggag	caggctc	660
cacagtgact	acatgaacat	gactcccc	cgccccgg	ccaccgc	gcattaccag	720
ccctatgccc	caccacgc	cttcgcag	tatcgctc	gacacggac	cctatccaga	780
agccagccgg	ctggcagccc	ccatctg	aatatcact	ctctggat	gaaatgaccg	840
ccatctccag	cggccac	cagcccc	tggccacca	atgccaattt	ttctcgagt	900
actagaccaa	atatcaagat	catttgaga	ctctgaaat	aagtaaaaga	gattcctgt	960
gacaggccaa	gtcttacagt	gccatggccc	acattcaac	ttaccatgt	cttagtgact	1020
tgactgagaa	gttagggtag	aaaacaaaaa	gggagtgg	tctggagcc	tctccctt	1080
ctca	tcacc	tgcacatctc	agtcaagcaa	agtgtgtat	ccacagacat	1140
gaagaaaggc	taggaaatca	ttcctttt	ttaatgg	gtttaatctt	ttggtagt	1200
ggttaaacgg	ggttagtt	atgggg	ggataggaa	gacatattt	aaaaccatta	1260
aaacactgtc	tcccactcat	gaaatgag	acgttagt	tatttaatgc	tgtttc	1320
tagtttagaa	atacatagac	attgtctt	atgaattct	atcatattt	gtcatttt	1380
ccaaatgagg	gatttgg	aatgaggat	tccctcaa	caatatcagg	taaaccagt	1440
tgcttc	actccctg	atgagact	agtgttaat	ttcacaat	acttcgaa	1500
gaataaaata	gttc					1514

Amino acid sequence of human CD28 (SEQ ID NO:1)

MLRLLLALNL FPSIQVTGNK **ILVKQSPMLV AYDNAVNLS** C KYSYNLFSRE FRASLHKGLD
SAVEVCVVG NYSQQQLQVYS KTGFNCDGKL GNESVTFYLQ NLYVNQTDIY FCKIEVMYPP
PYLDNEKSNG TIIHVKGKHL CPSPLFPGPS KPFWVLVVVG GVLACYSLLV TVAFIIFWVR
SKRSRLLHSD YMNMTPRRPG PTRKHYQPYA PPRDFAAYRS

The extracellular domain is shown in bold

The stalk region is underlined